

# THE CONSERVATION OF THE POTENTIALLY ENDANGERED IRRAWADY RIVER DOLPHIN *ORCAELLA BREVIROSTRIS* IN CHILKA LAGOON, ORISSA, INDIA<sup>1</sup>

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As per the list of 'IUCN Threatened Species Categories', the Irrawady River dolphin, *Orcaella brevirostris* Gray, 1966, falls under 'Insufficiently known' species. Considering its localisation within restricted areas and habitats as a thin population over an extensive range, this species is recommended to be brought under 'Rare' category, particularly in the Indian subcontinent.

As assessment of the present status of Irrawady River dolphin in Chilka lagoon, India, indicates that the deteriorating ecological condition, entangling in gill nets and drag nets, and wanton killing for oil have driven this localised population almost to the brink of extinction.

In order to perpetuate this species in Chilka lagoon, it is emphasised that, in addition to regulating the operation of gill nets and drag nets to prevent accidental capture, breeding of a protected population in a constantly monitored seminatural impoundment set in its natural habitat is the only alternative to restore the population to its erstwhile status.

## INTRODUCTION

*Orcaella brevirostris* was first identified from a skull collected from the Visakhapatnam Harbour, Bay of Bengal, out of a collection brought by Sir Walter Elliot. Owen (1866) tentatively identified it as *Phocaena brevirostris*, but it was Gray (1866) who described it properly and placed it under a new genus *Orcaella*. Later Anderson (1878) found these dolphins in large numbers in the Irrawady River of Burma (Myanmar), as far as 1500 km away from the open sea, hence the common name.

## GLOBAL STATUS

The global distribution of *Orcaella brevirostris* is along the coastal regions of Bay of Bengal, Malay Archipelago and Indo

Australian waters; in the river systems of Ganges, Brahmaputra, Irrawady, Mekong and Mahakam; and in the brackish waters of Chilka lagoon (Owen, 1866; Anderson, 1878; Annandale, 1915; Blanford, 1891; Morzer Bruins, 1966; Tas' an *et al.* 1980; Lyall, 1981; Aminul Haque, 1982 and Dhandapani, 1992).

These dolphins were found in freshwater rivers, lakes, brackish water lagoons and muddy estuaries. But their occurrence in open seas has hardly ever been reported, which could be due to their habit of not exposing themselves much above the water surface to avoid detection. Or, as Dudok Van Heel (1981) indicates, they were 'forced' to take shelter or refuge in the inshore, estuarine and backwater regions.

Presently in the Indian subcontinent, *Orcaella brevirostris* is met with only in three localities, the Chilka lagoon, the inshore and estuarine regions of the Orissa Coast and in the Brahmaputra estuarine network of Bangladesh

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(Annandale, 1915; Aminul Haque, 1982; James *et al.* 1989; and Dhandapani, 1992). Thus it can be inferred that the habitat niche of this dolphin is mainly in isolated pockets of the extensive coastal regions. Such localisation within restricted coastal pockets which are situated bordering the Bay of Bengal, Malay Archipelago and Indo-Australian waters rightly places this species in the 'Rare' rather than 'Insufficiently known' category of the IUCN Red List (1988).

It is to impress upon the nations bordering the Bay of Bengal the need to protect and perpetuate this species of dolphin, that a proposal is presented here. It is based on a case study of a particular population that is found to be "endemic" in Chilka lagoon.

#### STATUS IN CHILKA LAGOON

Annandale (1915) was the first to report the occurrence of *Orcaella brevirostris* in the Chilka lagoon. He stated that this species was found in large numbers in the outer channel at all times of the year in fresh as well as saltwater, in parties of three or four. He added that in Satpara the individuals were frequently observed rolling over and over on a shelf of sand at the margin of the lake. But the animals, though apparently abandoning themselves to play, slipped into deeper waters instantaneously at the slightest movement ashore. About the behaviour of parties of dolphins off Ghantasila and Barkul Point Chilka lake, Annandale (1915) stated that 'the Cetaceans would often rush in straight towards the rocks, as if about to land upon them.'

Such a pleasing sight which Annandale enjoyed is a dream now. Dhandapani (1992) indicated the alarming status of this dolphin in Chilka lagoon. He sighted only five dolphins during a six month survey in the lake, and among these two were dead. The local fishermen and the officials of the Orissa Fisheries Department estimated that not more than twenty Irrawady River dolphins, which are known as 'Bashiyya Magar' (oil yielding dolphin) in

Oriya, exist presently in Chilka lagoon.

The present reduced status of the dolphin in the Chilka lagoon is the result of seventy-seven years of neglect of the lagoon. It calls for attention to the factors that caused such a drastic reduction of its population. Evidently, the changing physiography of the lagoon and human interference with the environment were responsible.

#### CHANGING PHYSIOGRAPHY OF THE LAGOON

A review of the literature indicates that the lake was originally a part of the sea, and was rendered shallow by deposits from the mouth of Mahanadi and silt carried up the Bay (Blanford, 1872).

In his introduction to the 'Fauna of Chilka Lake', Annandale (1915) casually mentions that in the dry seasons the depth (?) rarely exceeds 2.4 m at the southern end and 1.2 m at the northern end. The deepest sounding was near Kalidai Is., measuring 3 m. He added that during flood season the depth increased by 3 m or 3.6 m uniformly.

According to the recent Expedition Report of the ZSI, the bathymetric data collected during flood season near the Kalidai Is, showed a maximum depth of approximately 2.8 m which according to Annandale was 4.5 m during his time. This indicates that silt deposition has taken place to an extent of 1.8 m during the past seven decades. I observed the deposits of very loose sand in the northern sector of the lake to a depth of 3-3.6 m which is due to river deposits. Such an unbelievably rapid rate of reduction in depth during the past seven decades has obviously left the Irrawady dolphin with a shrunken and shallow lake habitat.

Secondly, the immense growth of vegetation over an extensive area has reduced the waterspread portion of the lake considerably. According to Annandale (1915) 'in most parts of the lake the aquatic vegetation was scanty except in a few sheltered bays where a species

of *Potamogeton* was present'. Sudarshana (1992), while estimating the rate of growth of vegetation in Chilka lagoon from the Remote Sensing Data of IRS IA, reveals a startling reduction in the waterspread area at the rate of 23.42 sq. km over five years between 1984 and 1989 for emergent vegetation. But the submerged vegetation showed a slower rate of 5 sq. km over five years. Unfortunately, no comparative data is available for the previous years. Such a drastic reduction of space both horizontally and bathymetrically would obviously have created a non-conducive and discouraging environment for the Irrawady River dolphin and thus contributed to the decline of their population.

#### HUMAN INTERFERENCE IN CHILKA LAGOON

Chilka lagoon is the major fish producing centre of Orissa. Different species of mullets, prawns and mudcrabs form major constituents of the lake fauna. Traditionally, fishermen living in and around Chilka lagoon use different types of fishing gear pertaining to a particular kind of fishery. Notable among these are the gill nets and drag nets which are used for capturing mullet and prawns that are, incidentally, the food of these dolphins. Lured by the entrapped shoal of fish, these dolphins get entangled in the gill nets and drag nets, thus meeting with accidental death. Such a tragedy strikes them not only in Chilka lagoon but also in the inshore and estuarine regions of the Orissa coast (James *et al.* 1989).

The Irrawady dolphins are hunted for their oil, hence the Oriya name 'Bashiyya Magar' (oil yielding dolphin). Annandale (1915) narrates the sequence of hunting as follows: "out in the channel they commonly follow boats, and we were told that there was a man living in Satpara who could call them upto his boat and spear them for the sake of their oil which, in Orissa as in other parts of India, is regarded as a cure for rheumatism, applied externally."

Apart from the causes assigned above, it is the changing physiography of the lake and human interference (Annandale, 1915; Sudarshana, 1992; Dhandapani, 1992) that causes depletion in the population of the species in Chilka lagoon, thus necessitating the recognition of *Orcaella brevirostris* as a potentially endangered dolphin.

#### CONSERVATION METHODS

Two major factors that govern the existence of the Irrawady River dolphin in Chilka lagoon, i.e. human interference and changing physiography, need to be controlled to restore the dwindling population.

It is not possible to completely prevent the use of drag nets or gill nets in Chilka lagoon, as it would interfere with the traditional rights of the local fisherfolk and would hamper fish supply for local consumption, thus creating a socio-economic problem. Therefore, it is more advisable to try educating the illiterate fisherfolk as follows:

1. to protect these dolphins as they drive the fish shoals into their nets,
2. to prevent killing of the dolphins for their oil, which is believed to be a cure for rheumatism, and introduce them to other medical remedies.
3. to operate their fishing gear, particularly the gill nets and drag nets, by hauling them at quick intervals so as to release these dolphins, if captured by accident, back into the lake.

Perpetuation of the species by providing a suitable niche is possible only by installing a constantly monitored seminatural impoundment at a proper location in Chilka lagoon. The data collected during the recent survey by ZSI in Chilka lagoon indicates that the bay that lies between Barkul Point and Pathra is most suitable for conversion into a habitat for the Irrawady dolphin for the following reasons:

1. The bay between Barkul Point and Pathra covers an area of 20 sq. km.
2. The depth in this area, except near the shore, is 2 m, suitable for the free movement of dolphins and fish shoals.
3. Aquatic vegetation is comparatively less, and can be easily removed if necessary.
4. Water temperature varies from 25° to 32°C; and the salinity varies from 7 to 14 ppt which is a congenial brackish-water environment for this population of the brackish-water dolphin.
5. This area is always under the watchful eyes of INS Chilka, an establishment which is keen on protecting the fauna of Chilka lagoon.

## CONCLUSION

The time is ripe to take up protection, conservation and perpetuation of *Orcaella brevirostris*, the Irrawady River Dolphin, in the Chilka lagoon, since this population may never get another opportunity for recovery unless immediate remedial measures are initiated.

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## REFERENCES

- AMINUL HAQUE, A.K.M. (1982): Observations on the attitude of people in Bangladesh towards small Cetaceans. *Mamm. in Seas FAO*, 4: 117-119.
- ANDERSON, J. (1878): Anatomical and Zoological Research Comprising Account of the Zoological Results of the two Expeditions to Western Yunnan in 1868 and 1875, and the Monograph on the two Cetacean Genera *Platinesta* and *Orcaella*, Vol. I, Text; Vol. II, plates. London.
- ANNANDALE, N. (1915): Fauna of Chilka lake: Mammals, Reptiles and Betrachians. *Mem. Ind. Mus.* 5: 166-167.
- BLANFORD, W.T. (1872): Sketch of the geology of Orissa. *Rec. Geol. Surv. India*, V. pp 56.
- BLANFORD, W.T. (1891): *Orcaella brevirostris* and *O. fluminalis*. *Faun. Brit. Ind., Mammalia* (Pt. 2). pp 578-579, Fig. 189.
- DHANDAPANI, P. (1992): Status survey of Irrawady River Dolphin (*Orcaella brevirostris* Gray 1866) in Chilka lake. *J. mar. biol. Ass. India*, 34: 90-93.
- DUDOK VAN HEEL, W.H. (1981): Investigation on cetacean sonar. III. A. A proposal for an ecological classification of Odontocetes in relation with sonar. *Aq. mammals*, 8(2): 65-69.
- GRAY, J.E. (1866): Catalogue of Seals and Whales in the British Museum, London.
- IUCN, (1988): Red List of Threatened Animals, pp i-xviii, 1-154.
- JAMES, P.S.B.R., M. RAJAGOPALAN, S.D. DAN, A. BASTIAN FERNANDO & V. SELVARAJ (1989): On the mortality and stranding of marine mammals and turtles at Gahirmata, Orissa from 1983 to 1987. *J. mar. biol. Ass. India*, 31 (1 & 2): 28-35.
- LYALL, WATSON. (1981): Whales of the World. *Hutchinson*, 1-302.
- MORZER BRUINS, W.F.J. (1966): Some notes on Irrawady dolphin, *Orcaella brevirostris* (Owen, 1866): *Zeitschrift f. sauetierkunde*, 31(5): 367-370.
- OWEN, R. (1866): On some Indian Cetaceans collected by Walter Elliot, Esq. *Trans. Zool. Soc. London*, 6: 17-47.
- SUDARSHANA, R. (1992): Marine and coastal image data module 3: Practical lesson No. 5, UNESCO, pp 64.
- TAS'AN, ANNY IRWANDY, SUMITRO, SUKIMAN HENDROKUSOMO (1980): *Orcaella brevirostris* (Gray, 1866) from Mahakam River. *Jaya Acol Oceanarium*, Jakarta.